

(12) **United States Patent**
Card et al.(10) **Patent No.:** **US 6,646,652 B2**
(45) **Date of Patent:** **Nov. 11, 2003**(54) **SYSTEM AND METHOD FOR BROWSING
NODE-LINK STRUCTURES BASED ON AN
ESTIMATED DEGREE OF INTEREST**(75) Inventors: **Stuart K. Card**, Los Altos Hills, CA
(US); **David A. Nation**, Hanover, MD
(US)(73) Assignee: **Xerox Corporation**, Stamford, CT
(US)(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 341 days.(21) Appl. No.: **09/748,027**(22) Filed: **Dec. 21, 2000**(65) **Prior Publication Data**

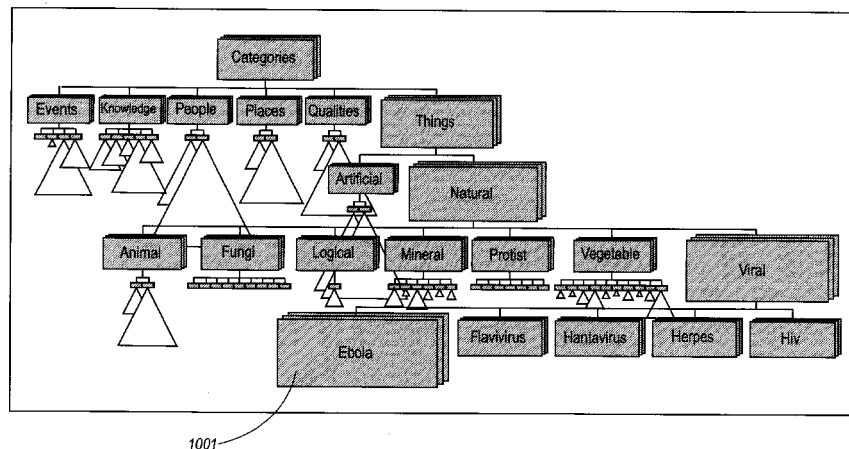
US 2002/0118214 A1 Aug. 29, 2002

(51) **Int. Cl.**⁷ **G06T 15/00**(52) **U.S. Cl.** **345/645**(58) **Field of Search** 345/645, 853,
345/848, 419, 427, 440(56) **References Cited****U.S. PATENT DOCUMENTS**5,786,820 A * 7/1998 Robertson 345/853
6,057,843 A 5/2000 Van Overveld et al. 345/357
6,369,819 B1 * 4/2002 Pitkow et al. 345/440**OTHER PUBLICATIONS**Furnas, Generalized Fisheye Views, ACM, CHI'86 Proceed-
ings, pp. 1623, 1986.*Herman, Ivan et al. "Latour-A Tree Visualisation System",
Graph Drawing 7th International Symposium, GD'99. Pro-
ceedings (Lecture Notes in Computer Science vol. 1731),
Proceedings of Conference on Graph Drawing, Stirin Castle,
Czech Republic, Sep. 15-19, 1999, pp. 392-399,
XP002228747, 1999, Berlin, Germany, Springer-Verlag,
Germany.Noik, Emanuel G. "Exploring Large Hyperdocuments: Fish-
eye Views of Nested Networks", Proceedings CASCON '93,
Proceedings of CASCON '93, Toronto, Ontario, Canada,
Oct. 24-28, 1993, pp. 661-676, vol. 2, XP008012935 1993,
Ottawa, Ontario, Canada, Nat. Res. Council of Canada,
Canada.Sarkar, Manojit et al. "Graphical Fisheye Views of Graphs",
Striking a Balance, Monterey, May 3-7, 1992, Proceedings
of the Conference on Human Factors in Computing Sys-
tems, Reading, Addison Wesley, US, May 3, 1992, pp.
83-91, XP000426810.Turo, David et al. "Improving the Visualization of Hierar-
chies with Treemaps: Design Issues and Experimentation",
Proceedings Visualization '92 (Cat. No. 92CH3201-1), Bos-
ton, MA, USA, Oct. 19-23, 1992, pp. 124-131,
XP002228633 1992, Los Alamitos, CA, USA, IEEE Compt.
Soc. Press, USA.

* cited by examiner

Primary Examiner—Phu K. Nguyen(57) **ABSTRACT**

Method and system to enable a user to view large collections of linked information on a computer based display. A visualization is created which presents a representation of the complete collection of information on the display. The visualization fits completely within a fixed area of the computer-based display, negating the need to scroll information into the display area. The visualization is based on identified focus nodes and through calculation of a Degree of Interest (DOI) for each of the nodes based in the structure. Layout and presentation of the visualization structure is based on the DOI values in combination with considerations of available display space. A user may dynamically manipulate views of the structure by selecting one or more focus nodes, thus causing a recalculation of the degree of interest.

6 Claims, 14 Drawing Sheets

1001